

### **REMARKS**

Claims 1-17, 19-20 and new claim 22 are pending. Claim 1 is amended to delete subject matter and new Claims 22 is based upon original claim 1. Claims 18 and 21 have been cancelled without prejudice or disclaimer.

No new matter has been added.

**Claim 18 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.** (Office Action, Page 2)

Claims 18 and 21 are canceled making this rejection now moot.

### **Rejections under 35 U.S.C. 103(a)**

**Claims 1, 4, 11-12 and 16-17 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Nowak et al. (US 6,503,965: hereinafter “Nowak”) in view of Schrempp et al.(US 3,849,150, hereinafter “Schrempp”).** (Office Action, Page 3)

This rejection is traversed.

Regarding claim 1, the Office Action alleges:

Nowak discloses all the claim limitations as set forth above. However, while the references discloses resins comprising amino groups, i.e., melamine, the reference does not disclose that the resin has an amino group concentration of 50 to 500 mmol/kg. However, it is the Examiner’s position that the amount of amino group in the resin is result effective variable because changing them will clearly affect the type of product obtained (internal citation omitted). ...in view of this, it would have been obvious to one of ordinary skill in the art to utilize appropriate amount of amino groups, including those within the scope of the present claims, so as to produce desired end results.

Applicants respectfully disagree.

The invention recited in claim 1 is directed to an ink comprising: metal thin film fragments having an average thickness of 0.01 to 0.1  $\mu\text{m}$  and an average particle diameter of 5 to 25  $\mu\text{m}$ ; and a binder resin having 50 to 500 mmol/kg of at least one selected from the group consisting of a carboxyl group, a phosphoric acid group, a sulfonic acid group and metal salts

thereof. This unique combination of a binder resin having a specific functional group with metal thin film fragments having a specific shape enables to achieve excellent adhesion between metal thin film fragments and a binder resin.

***The unexpected results of this combination is shown in Table 1 as well as the Inventor's Declaration attached hereto.*** Inks 1-3 in Table 1 which contain carboxyl group and sulfonic acid group within the specific range (50 to 500 mmol/kg) show superior properties compared to those of inks 4 and 5. Same is true for the inks 11-A and 12-A in the Declaration where interlaminar peel strength and viscosity of the inks show similar superiority to those for inks 1-3. Moreover, as stated in the Declaration, when a functional group exceeds 500 mmol/g, a resin cannot be obtained due to gelation in the middle of the reaction.

Neither Nowak nor Schrempp, alone or in combination, suggests the claimed invention and the result achieved by the combination of claimed components.

In addition, although the Examiner specifically referred to the use of melamine, Applicants note that MPEP 2143.02 provides that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 409, 82 USPQ2d 1385, 1396 (2007) (emphasis added). Here, Nowak used only "hydrocarbon resin" in the example section and *no other resins were actually tested as second resins*. Thus, even if melamine is listed as mere examples of second resins, the results would not have been predictable to one of ordinary skill in the art.

Regarding claims 4, 11, 12, 16 and 17, since neither Nowak nor Schrempp suggested and taught the invention recited in claim 1, and claims dependent thereon, the invention is neither suggested nor taught by the references and thus not obvious. It is respectfully requested that the rejection be reconsidered and withdrawn.

**Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al. (US 6,503,965) and Schrempp et al (US 3,849,150) as applied to claims 1, 4, 11-12, and 16-17 above, and in view of Molloy et al (US 6,476,096).** (Office Action, Page 8)

As stated above, neither Nowak nor Schrempp teaches or suggests the invention recited in claim 1. Therefore, Nowak and Schrempp do not make the claimed invention *prima facie*

obvious and even if Molloy is combined, the claimed invention still cannot be obvious.

**Claims 15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al (US 6,503,965) in view of Schrempp et al (US 3,849,150) and Molloy et al (US 6,476,096). (Office Action, Page 9)**

The Office Action alleges:

The combined disclosures of Nowak and Schrempp et al disclose all the claim limitations as set forth above. However, the references do not disclose that the ink composition comprising an acid anhydride.

Molloy et al discloses the used of acid annhydrides in non-aqueous ink compositions, i.e., succunic anhydride which are added to the ink compositions in over to enhance the stability of the ink composition (Abstract, Column 4, Lines 31-36, Lines 53-57 and Lines 61-67). Furthermore the reference disclose that anhydride is added to the ink composition in an amount up to 50wt% based on the amount of pigments (Column 10, Lines 29-31, claim 11). ...

The Applicants respectfully disagree.

The Applicants note that Molloy does not disclose metal thin film fragments as a preferable pigment. Instead, general pigment dyes are used in Molloy. Molloy fails to disclose the suitable effect of the combination of the metal thin film fragments, a specific resin and acid anhydride.

Furthermore, contrary to the Examiner's statement based on the description in column 4, lines 31- 36, 53- 57 and 61- 67 of Molloy that Molloy discloses the use of acid anhydride in order to enhance the stability of the ink composition, Molloy merely discloses that one or more of the compounds having at least C<sub>36</sub> aliphatic group and at least one  $\alpha$ ,  $\beta$ -di-carboxylic acid imide moiety can be used as a dispersant when they are combined with an anhydride. In other words, Molloy does not disclose that *an anhydride itself* can function as a dispersant.

In addition, Molloy fails to suggest the effect of an acid anhydride shown by the present invention, as shown in Table 1 of the instant specification, summarized as below:

	Ink	Viscosity after aging at 40°C for 7 days
Example 1	Ink 1	gelled
Example 4 (acid anhydride was used)	Ink 1-A	20

	Ink	Viscosity after aging at 40°C for 7 days
Example 2	Ink 2	106
Example 5 (acid anhydride was used)	Ink 2-A	22
Example 6 (acid anhydride was used)	Ink 2-B	24

As clear from the table above, the viscosity after aging at 40°C for 7 days of the samples wherein an acid anhydride is used (Examples 4, 5 and 6) is lower than the sample wherein an acid anhydride is not used (Examples 1 and 2). The results supposed that, an acid anhydride is absorbed to metal thin film fragments, and excess absorption caused by a binder resin having a functional group, wherein such excess absorption causes thickening and gelation, can be prevented.

Accordingly, as stated above, neither Nowak nor Schrempp, alone or in combination, suggests or teaches this specific combination of claimed components and the result achieved by the combination. In addition, Molloy fails to suggest and teach the effect of an acid anhydride. In sum, Nowak, Schrempp and Molloy, alone or in combination, neither suggest nor teach the invention recited in claim 15 and its dependent claims 19 and 20 as well.

It is respectfully requested that the rejection be reconsidered and withdrawn.

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1105.

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Respectfully submitted,

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Attachment: Declaration under 37 CFR §1.132 (6 pages)